

## CLAIMS

**Claim 1.** This auto translator consists of :

(1) The Word Database(100) : It has 4 corresponding dictionaries db. Every db is arranged in  
5 alphabetical order and recorded the whole information of the English words and the  
translated Chinese words according to the dictionary editing system in English and Chinese language.

(2) The device(200) : It analyzes the words of the inputted original sentence into the morpheme units.

(3) The device(300) : It arranges the results of the device (200) for the basic sentence elements  
that contain a part of speech and this device translates the original English words into Chinese  
10 words according to the word dictionary db.

(4) The device(400) -- the modulatory translation module : It checks whether the compound word,  
idiom, colloquialism exist in the results of (300) or not. And if there are, the device modulates  
the basic sentence elements of them into the modulatory sentence elements and converts a part of  
speech of them if it needs to do (In this process, new converted word class being created). And this  
15 device translates the original English words into Chinese words according to the word dictionary db.

(5) The device(500) -- the specific translation module : It checks the results of (300), the results  
of (400) and checks the inputted original sentence with the Linking Pointer of the specific sentence  
elements. And if a linking data exists between them, the Linking Pointer of the specific sentence  
elements checks whether the data of the word(words) is marked with the discerning factor or not. If  
20 it is, the Linking Pointer of the specific sentence elements and the discerning factor indicate  
that the word(words) should be controlled by the one of 5 (peculiar) specific translation modules.  
The device of specific translation module(500) has 5 (peculiar) specific translation modules(501~  
505) that are activated by the Linking Pointer of the specific sentence elements and the discerning  
factor jointly. And this device rechecks the results of each (peculiar) specific translation module  
25 and rearranges the translated Chinese words and the word order according to the word order rules in  
Chinese language.

(6) The device(600) -- the general translation module : It checks the results of (500) and eliminates  
the translated Chinese word which is unnecessary in the final translated Chinese sentence and  
inserts the special Chinese word which is necessary in the final translated Chinese sentence,  
30 according to the special translation conditions in Chinese grammar. And this device rechecks  
whether the secondly translated Chinese word - which is converted again by the specific translation  
module - is linked with the word order rules of the Word Database or not. If it exists, this device

reconstructs the translated Chinese words according to the word order rules in Chinese language.

(7) The device(700) : It outputs the complete translated Chinese sentence.

The Linking Pointer of the specific sentence elements which links with the device(500) -- the specific translation module -- cooperates with 5 (peculiar) Specific Translation Modules(501~505).

5 The First Specific Translation Module(501) checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the translated Chinese verb of the original English sentence belongs to Liheci(离合词) or not. And if it belongs to Liheci, this module checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the original English sentence is the past tense or not. The result is affirmative, this module puts  
10 "了" between the disyllabic or trisyllabic ( it's also separated into two parts) word of the translated Chinese verb. At the same time this module checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the original English sentence has an adverb of frequency or not. And if it has, this module puts, by the Linking Pointer of the specific sentence elements and the discerning factor, the translated Chinese word for the English adverb of  
15 frequency just after "了". If the original English sentence is not the past tense, the translated Chinese word for the English adverb of frequency is located without "了".

The Second Specific Translation Module(502) checks the translated Chinese words, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the word —the complement of degree, as a sentence element— exists or not. If it exists, the Linking Pointer of  
20 the specific sentence elements and the discerning factor check whether the complement of degree accompanies the translated Chinese verb of the original English sentence or not. If it does, this module inserts the Chinese word "得"(Chinese letter which expresses the degree of the verb in Chinese sentence.) just behind the translated Chinese verb. And just after the word "得", this module locates the translated Chinese word, the complement of degree.

25 The Third Specific Translation Module(503) checks the translated Chinese words, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the word —the complement of result, as a sentence element— exists or not. If it exists, the Linking Pointer of the specific sentence elements and the discerning factor check whether the complement of result accompanies the translated Chinese verb of the original English sentence or not. If it does, this  
30 module locates the translated Chinese word, the complement of result, just after the translated Chinese verb.

The Fourth Specific Translation Module(504) checks, by the Linking Pointer of the specific

sentence elements and the discerning factor, whether the original English sentence structure is "be+p.p" or not. If it is, this module checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the translated Chinese verb of the original English sentence rules over, or exercises influence over the action of the animate/things or not. And if it 5 does, the Chinese word "被" is affixed to the head of that translated Chinese verb. Next this module with the Linking Pointer of the specific sentence elements and the discerning factor recheck the translated Chinese word of the English preposition – which locates just behind the English verb – whether that translated Chinese word is proper or not, in relation to the translated Chinese verb according to the Chinese grammar. Because the translated Chinese word of the English preposition has 10 some special translation conditions in Chinese grammar. And next this module reconstructs the translated Chinese words according to the word order rules in Chinese language.

The Fifth Specific Translation Module(505) checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the original English sentence is an adjective phrase sentence or not. If it is, this module eliminates, by the Linking Pointer of the specific 15 sentence elements and the discerning factor, the translated Chinese word for the original English word "be" and next reconstructs the translated Chinese words according to the word order rules in Chinese language.

Every English word, in the Word Database, has the data about the morpheme units(a common feature), the basic sentence elements(a common feature),the modulatory sentence elements(an 20 independent feature), the specific sentence elements(an independent feature). Especially the specific sentence elements are marked with the discerning factor in the first, the second, the third word dictionary db. The discerning factor, checks the information of the specific sentence elements in English words, is activated in the specific translation module by the Linking Pointer of the specific sentence elements.

25 The discerning factor and the Linking Pointer of the specific sentence elements appoint the English word(words), which links with them, to the first~fifth specific translation module that translates the original English sentence into the accurate and natural translated Chinese sentence.

The first word dictionary db of the Word Database stored the information of the common word. The second, the third word dictionary db of the Word Database stored the information of the compound 30 word, idiom, colloquialism. The fourth word dictionary db stored the information of the terminology.

**Claim 2.** Following the Claim 1, this auto translator consists of :

The 4 word dictionaries db in the Word Database(100). It is arranged in alphabetical order and recorded the whole information of the English words and the translated Chinese words. Especially the first, second, third word dictionary db is recorded the whole information about the word data of the specific sentence elements in English and Chinese words on both sides.

5 Through the Word Database(100), every translated Chinese word and every word of the original English sentence are checked by the Linking Pointer of the specific sentence elements, which links with the device (500).

Through the Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese verb and every verb of the original English sentence whether the 10 discerning factor of Liheci is marked or not. And if is, the Linking Pointer of the specific sentence elements and that discerning factor of Liheci check whether the original English sentence is the past tense or not. At the same time they check whether the original English sentence has an adverb of frequency or not. It is the process of the first specific translation module.(501)

Through this Word Database(100), the Linking Pointer of the specific sentence elements checks 15 every translated Chinese word and every inputted original English word whether the discerning factor of the complement of degree is marked or not. If it is, the Linking Pointer of the specific sentence elements and that discerning factor check whether that translated Chinese word(the complement of degree) accompanies the translated Chinese verb of the original English sentence or not. It is the process of the second specific translation module.(502)

20 Through this Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese word and every inputted original English word whether the discerning factor of the complement of result is marked or not. If it is, the Linking Pointer of the specific sentence elements and that discerning factor check whether that translated Chinese word(the complement of result) accompanies the translated Chinese verb of the original English sentence or not. It is the 25 process of the third specific translation module.(503)

Through this Word Database(100), the Linking Pointer of the specific sentence elements checks the translated Chinese words and the original English words whether the discerning factor of passive voice is marked or not. The result is affirmative, the Linking Pointer of the specific sentence elements and that discerning factor check whether that translated Chinese verb of 30 the original English sentence rules over, or exercises influence over the action of the animate/things or not. And they check whether the translated Chinese word of the English preposition – which locates just behind the English verb – is proper in Chinese language or not. It

is the process of the fourth specific translation module.(504)

Through this Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese phrase and every original English phrase whether the discerning factor of "be + adjective" is marked or not. If it is, the Linking Pointer of the specific sentence elements 5 and that discerning factor eliminate the translated Chinese word for the original English word "be" and next reconstructs the translated Chinese words according to the word order rules in Chinese language. It is the process of the fifth specific translation module.(505)

10 **Claim 3.** The recording medium by which this auto translation method is programmed, as mentioned above, consists of :

- (1) The Word Database(100) : It has 4 corresponding dictionaries db. Every db is arranged in alphabetical order and recorded the whole information of the English words and the translated Chinese words according to the dictionary editing system in English and Chinese language.
- (2) The device(200) : It analyzes the words of the inputted original sentence into the morpheme 15 units.
- (3) The device(300) : It arranges the results of (200) for the basic sentence elements that contain a part of speech, and this device translates the original English words into Chinese words according to the word dictionary db.
- (4) The device(400) -- the modulatory translation module : It checks whether the compound word, 20 idiom, colloquialism exist in the results of (300) or not. And if there are, this device modulates the basic sentence elements of them into the modulatory sentence elements and converts a part of speech of them if it is needed(In this process, new converted word class being created). And this device translates the original English words into Chinese words according to the first, the second, the third dictionary db.
- (5) The device(500) -- the specific translation module : It checks the results of (300), the results 25 of (400) and checks the inputted original sentence with the Linking Pointer of the specific sentence elements. And if a linking data exists between them, this device checks whether the data of the word(words) is marked with the discerning factor or not. If it is, the Linking Pointer of the specific sentence elements and the discerning factor indicate that the word(words) should be controlled by the one of 5 (peculiar) specific translation modules. This device rechecks the results 30 of each (peculiar) specific translation module and rearranges the translated Chinese words and word order according to the word dictionary db.

The device of specific translation module(500) has 5 (peculiar) specific translation modules(501~505) that are activated by the Linking Pointer of the specific sentence elements and the discerning factor jointly. Through the process of this device(500), the data of the original English words are translated into the accurate, natural Chinese words according to the Word 5 Database.

(6) The device(600) -- the general translation module : It checks the results of (500) and eliminates the translated Chinese word which is unnecessary in the final translated Chinese sentence and inserts the special Chinese word which is necessary in the final translated Chinese sentence, according to the special translation conditions in Chinese language grammar. Now this 10 module rechecks whether the secondly translated Chinese word — which is converted again by the specific translation module — is linked with the word order rules of the Word Database or not. If it exists, this module reconstructs the word order of the secondly translated Chinese words according to the word order rules in Chinese language.

(7) The device(700) : It outputs the complete translated Chinese sentence.  
15 The device (500) -- the Linking Pointer of the specific sentence elements links with this device -- has 5 (peculiar) Specific Translation Modules.

The First Specific Translation Module(501) checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the translated Chinese verb of the original English sentence belongs to Liheci or not. And if it belongs to Liheci, this module checks whether 20 the original English sentence is the past tense or not. The result of checking is the past tense, this module puts "了" between the two separated words of the translated Chinese verb. Next this module checks whether the original English sentence has an adverb of frequency or not. And if it has, this module puts the translated Chinese word for the adverb of frequency in English just after "了". If the original English sentence is not the past tense, the translated Chinese word for the 25 adverb of frequency in English is located without "了".

The Second Specific Translation Module(502) checks the translated Chinese words, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the word —the complement of degree, as a sentence element— exists or not. If it exists, the Linking Pointer of the specific sentence elements and the discerning factor check whether the complement of degree 30 accompanies the translated Chinese verb of the original English sentence or not. If it does, this module inserts the Chinese word "得" just behind the translated Chinese verb. And just after the word "得", this module locates the translated Chinese word, the complement of degree.

The Third Specific Translation Module(503) checks the translated Chinese words, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the word —the complement of result, as a sentence element— exists or not. If it exists, the Linking Pointer of the specific sentence elements and the discerning factor check whether the complement of result 5 accompanies the translated Chinese verb of the original English sentence or not. If it does, this module locates the translated Chinese word, the complement of result, just after the translated Chinese verb.

The Fourth Specific Translation Module(504) checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the original English sentence structure is 10 "be+p.p" or not. If it is, this module checks whether the translated Chinese verb of the original English sentence rules over, or exercises influence over the action of the animate/things or not. If it does, the Chinese word "被"(This word means the passive voice in Chinese.) is affixed to the head of that translated Chinese verb. Now this module, by the Linking Pointer of the specific sentence elements and the discerning factor, rechecks the translated Chinese word of the English preposition 15 — which locates just behind the English verb — whether that translated Chinese word is proper or not, in relation to the translated Chinese verb according to the Chinese grammar. Because the translated Chinese word of the English preposition has some special translation conditions in Chinese grammar. Then this module reconstructs the translated Chinese words according to the word order rules in Chinese language.

20 The Fifth Specific Translation Module(505) checks, by the Linking Pointer of the specific sentence elements and the discerning factor, whether the original English sentence is an adjective phrase sentence or not. If it is, this module eliminates the translated Chinese word for the original English word "be" and next reconstructs the translated Chinese words according to the word order rules in Chinese language.

25 Every English word, in the Word Database, has the data about the morpheme units(a common feature), the basic sentence elements(a common feature), the modulatory sentence elements(an independent feature), the specific sentence elements(an independent feature). Especially the specific sentence elements are marked with the discerning factor in the first, the second, the third word dictionary db. The discerning factor, checks the information of the specific sentence elements 30 in English words, is activated in the 5 (peculiar) specific translation modules by the Linking Pointer of the specific sentence elements.

The discerning factor and the Linking Pointer of the specific sentence elements appoint the

English word(words), which links with them, to the first~fifth specific translation module that translates the original English sentence into the accurate and natural translated Chinese sentence.

The first corresponding word dictionary db of the Word Database stored the information of the common word. The second, the third word dictionary db stored the information of the compound word, idiom, colloquialism. The fourth word dictionary db stored the information of the terminology.

**Claim 4.** Following the Claim 3, the recording medium consists of :

The Word Database(100) is arranged in alphabetical order and recorded the whole information of the English words and the translated Chinese words. Especially the first, the second, the third word dictionary db is recorded the whole information about the word data of the specific sentence elements in English and Chinese words on both sides.

Through the Word Database(100), every translated Chinese word and every word of the original English sentence are checked by the Linking Pointer of the specific sentence elements, which links with the device (500), in the process of the specific translation module(500).

Through the Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese verb and every verb of the original English sentence whether the discerning factor of Liheci is marked or not. And if it is, the Linking Pointer of the specific sentence elements and that discerning factor of Liheci check whether the original English sentence is the past tense or not. At the same time they check whether the original English sentence has an adverb of frequency or not. It is the process of the first specific translation module.(501)

Through the Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese word and every inputted original English word whether the discerning factor of the complement of degree is marked or not. If it is, the Linking Pointer of the specific sentence elements and that discerning factor check whether that translated Chinese word(the complement of degree) accompanies the translated Chinese verb of the original English sentence or not. It is the process of the second specific translation module.(502)

Through the Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese word and every inputted English word whether the discerning factor of the complement of result is marked or not. If it is, the Linking Pointer of the specific sentence elements and that discerning factor check whether that translated Chinese word(the complement of result) accompanies the translated Chinese verb of the original English sentence or not. It is the

process of the third specific translation module.(503)

Through the Word Database(100), the Linking Pointer of the specific sentence elements checks the translated Chinese words and the original English words whether the discerning factor of passive voice is marked or not. The result is affirmative, the Linking Pointer of the 5 specific sentence elements and that discerning factor check whether that translated Chinese verb of the original English sentence rules over, or exercises influence over the action of the animate/things or not. And they check whether the translated Chinese word of the English preposition – which locates just behind the English verb – is proper or not, in Chinese language. It is the process of the fourth specific translation module.(504)

10 Through the Word Database(100), the Linking Pointer of the specific sentence elements checks every translated Chinese phrase and every original English phrase whether the discerning factor of "be + adjective" is marked or not. If it is, the Linking Pointer of the specific sentence elements and that discerning factor eliminate the translated Chinese word for the original English word "be" and next reconstructs the translated Chinese words according to the word order rules in 15 Chinese language. It is the process of the fifth specific translation module.(505)

**Claim 5.** The automatic translation method of this invention consists of :

The stage(S100) : has the Word Database.

The stage(S200) : analyzes the words of the inputted original sentence into the morpheme units.

20 The stage(S300) : arranges the results of (200) for the basic sentence elements that contain a part of speech, and this device translates the English words into Chinese words according to the word dictionary db.

25 The stage(S400) : checks whether the compound word, idiom, colloquialism exist in the results of (300) or not. If there are, the device (400) modulates the basic sentence elements of them into the modulatory sentence elements and converts a part of speech of them if it is needed(In this process, new converted word class being created). And this device translates the original English words into Chinese words according to the word dictionary db.

30 The stage(S500) : checks the results of (300), the results of (400) and checks the inputted original sentence with the Linking Pointer of the specific sentence elements. And if a linking data exists between them, the device (500) checks whether the data of the word(words) is marked with the discerning factor or not. If it is, the Linking Pointer of the specific sentence elements and the discerning factor indicate that the word(words) should be controlled by the one of 5 (peculiar)

specific translation modules. This device rechecks the results of each (peculiar) specific translation module and rearranges the translated Chinese words and word order according to the word order rules in Chinese language.

The stage(S600) : checks the results of (500) and eliminates the translated Chinese word which  
 5 is unnecessary in the final translated Chinese sentence and inserts the special Chinese word which  
 is necessary in the final translated Chinese sentence, according to the special translation  
 conditions in Chinese grammar. And this stage rechecks whether the secondly translated Chinese word  
 – which is converted again by the specific translation module – is linked with the word order rules  
 of the Word Database or not. If it exists, this stage reconstructs the word order of the secondly  
 10 translated Chinese words according to the word order rules in Chinese grammar.

The stage(S700) : outputs the complete translated Chinese sentence.

And the stage(S500) consists of :

The stage(S501) : The Linking Pointer of the specific sentence elements and the discerning  
 factor check whether the translated Chinese verb of the original English sentence belongs to Liheci  
 15 (离合词) -- one kind of verbs in Chinese Grammar -- or not. And if it belongs to Liheci, the  
 first specific translation module checks whether the original English sentence is the past tense or not.  
 And the result is the past tense, the first specific translation module puts "了"(This Chinese  
 letter means that the sentence is the past tense.) between the two separated words of the translated  
 Chinese verb. Next the first specific translation module, by the Linking Pointer of the specific  
 20 sentence elements and the discerning factor, checks whether the original English sentence has an  
 adverb of frequency or not. If it has, this module puts the translated Chinese word for the English  
 adverb of frequency just after "了". If the English sentence is not the past tense, the translated  
 Chinese word for the English adverb of frequency is located without "了".

The stage(S502) : If the translated Chinese word is checked as the word of the complement of  
 25 degree by the Linking Pointer of the specific sentence elements and the discerning factor, the  
 second specific translation module checks whether the complement of degree accompanies the  
 translated Chinese verb of the original English sentence or not. If it does, this module inserts  
 the Chinese word "得" just behind the translated Chinese verb. And just after the word "得", this  
 module locates the translated Chinese word, the complement of degree.

30 The stage(S503): If the translated Chinese word is checked as the word of the complement of  
 result by the Linking Pointer of the specific sentence elements and the discerning factor, the third  
 specific translation module checks whether the complement of result accompanies the translated

Chinese verb of the original English sentence or not. If it does, this module locates the translated Chinese word, the complement of result, just after the translated Chinese verb.

The stage(S504): The Linking Pointer of the specific sentence elements and the discerning factor check whether the original English sentence structure is "be+pp" or not. And if it is, the 5 fourth specific translation module checks whether the translated Chinese verb of the original English sentence rules over, or exercises influence over the action of the animate/things or not. If it does, the Chinese word "被"(This word means the passive voice in Chinese sentence.) is affixed to the head of that translated Chinese verb. Next this module rechecks the translated Chinese word of the English preposition – which locates just behind the English verb – whether that 10 Chinese word is proper or not, in relation to the translated Chinese verb according to the Chinese grammar. Because the translated Chinese word of the English preposition has some special translation conditions in Chinese grammar. And next this module reconstructs the translated Chinese words according to the word order rules in Chinese language.

The stage(S505): The Linking Pointer of the specific sentence elements and the discerning 15 factor check whether the original English sentence is an adjective phrase sentence or not. And if it is, the fifth specific translation module eliminates the translated Chinese word for the original English word "be" and next reconstructs the translated Chinese words according to the word order rules in Chinese language.

In the stage of the device (S500), the Linking Pointer of the specific sentence elements and 20 the discerning factor and each specific translation module work as trinity.